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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,560	01/30/2002	Yongfei Zhu	PARA 50439	8646

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EXAMINER

VANNUCCI, JAMES

ART UNIT	PAPER NUMBER
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2821

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/060,560	Applicant(s) ZHU ET AL.	
	Examiner Jim Vannucci	Art Unit 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 13-15 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 9, 11, 12 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Shapiro et al.(5,043,738).

Claim 1, figure 4 discloses a radiating element(58), a microstrip feed line assembly(66 & 68), and a ground plane(54) positioned between the radiating element and the feed line assembly(66 & 68) having a plurality of orthogonal openings adjacent the radiating element(58). Figure 8 discloses the radiating element used in a phased array and being connected to a phase shifter(128) that is coupled to the feed line assembly(66 & 68).

Claim 2, the openings(82 & 84) disclosed in figure 4 are elongated.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-8, 10, 13-15 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapiro in view of Yandrofski et al.(5,589,845).

Shapiro does not disclose the following elements that are disclosed in Yandrofski and improve the tuning of an array antenna(abstract).

Claim 3, figure 8 of Yandrofski discloses a linear microstrip line(56 or 57) connected to a plurality of microstrip lines where each of the plurality of microstrip lines extends perpendicularly from the linear microstrip line.

Claim 4, figure 8 of Yandrofski discloses a plurality of radiating elements arranged in a plurality of rows and columns where the feed line assembly further includes additional linear microstrip lines(56 or 57) and additional pluralities of microstrip lines extending perpendicularly from the additional linear microstrip lines.

Claim 5, figure 4 of Shapiro discloses a first portion(68) of each of the plurality of microstrip lines with an approximate 90 degree bend positioned between sections of the first portion that are positioned adjacent to the orthogonal openings in one of the pairs of orthogonal openings.

Claim 6, Yandrofski discloses a first portion of each of the plurality of microstrip lines having a predetermined length for providing a phase shift between the openings of an adjacent one of the pairs of orthogonal openings(col. 8, lines 44-54).

Claim 7, the phase shifter disclosed in figure 10 of Yandrofski has a first substrate(71), a tunable dielectric film(70) positioned on a surface of the first substrate(71), a coplanar waveguide(66-69) positioned on a surface of the tunable dielectric film(70) opposite the first substrate, an input for coupling a radio frequency

signal to the coplanar waveguide an output for receiving the radio frequency signal from the coplanar waveguide(fig. 11, nos. 85-86 & 94-95), and a connection for applying a control voltage to the tunable dielectric film.

Claim 8, the spacing of the input and output(fig. 11, nos. 85-86 & 94-95) disclosed in Yandrofski includes a first impedance matching section of the coplanar waveguide coupled to the input; and a second impedance matching section of the coplanar waveguide coupled to the output.

Claim 10, figure 12 of Yandrofski discloses a connection for applying a control voltage to a tunable dielectric film(101) that has a first electrode(105) position adjacent a first side of a conductive strip(103) of the coplanar waveguide to form a first gap between the first electrode and the conductive strip(103), and a second electrode(104) position adjacent a second side of the conductive strip(102) to form a second gap between the second electrode and the conductive strip(102).

Claims 13 and 17-18, Yandrofski discloses a substrate of MgO, LaA103, sapphire, A1203, and a ceramic(col. 5, lines 61-62).

Claim 14, the substrate disclosed in Yandrofski has a dielectric constant less than 25(col. 5, lines 61-62).

Claims 15 and 19, the tunable dielectric film disclosed in Yandrofski could be manufactured to have a dielectric constant of greater than 300.

Claim 20, Shapiro discloses conductors around the phase shifter(col. 1) that form a conductive housing enclosing the phase shifter.

It would have been obvious to one of ordinary skill in the art at the time of the

invention to use the tuning elements disclosed in Yandrofski with the antenna array disclosed in Shapiro for improved tuning of the antenna as disclosed in Yandrofski.

Allowable Subject Matter

5. Claims 9, 11-12 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter. The following limitations are primarily responsible for distinguishing these claims over the prior art.

Regarding claim 9, the limitation concerning the impedance matching sections comprising tapered coplanar waveguide sections.

Regarding claim 11, the limitations concerning a third electrode positioned adjacent a first side of the first electrode opposite the conductive strip to form a third gap between the first electrode and the third electrode, and a fourth electrode position adjacent a first side of the second electrode opposite the conductive strip to form a fourth gap between the second electrode and the fourth electrode.

Regarding claim 12, the limitation concerning a conductive dome electrically connected between the first and second electrodes .

Regarding claim 16, the limitation concerning a second substrate positioned adjacent to an end of the first substrate, a microstrip line positioned on a surface of the

second substrate, and a connection between the microstrip line and a conductive strip of the waveguide.

Response to Arguments

7. Applicant's arguments with respect to claims 1-8, 10, 13-15 and 17-20 have been considered but are moot in view of the new ground(s) of rejection. While the previous rejection was proper, examiner has found a better primary reference in Shapiro.

Correspondence

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Jim Vannucci whose phone number is (571) 272-1820.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center whose telephone number is (703) 308-0956.

Papers related to Technology Center 2800 applications only may be submitted to Technology Center 2800 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Technology Center Fax Center number is (703) 872-9306.


James Vannucci